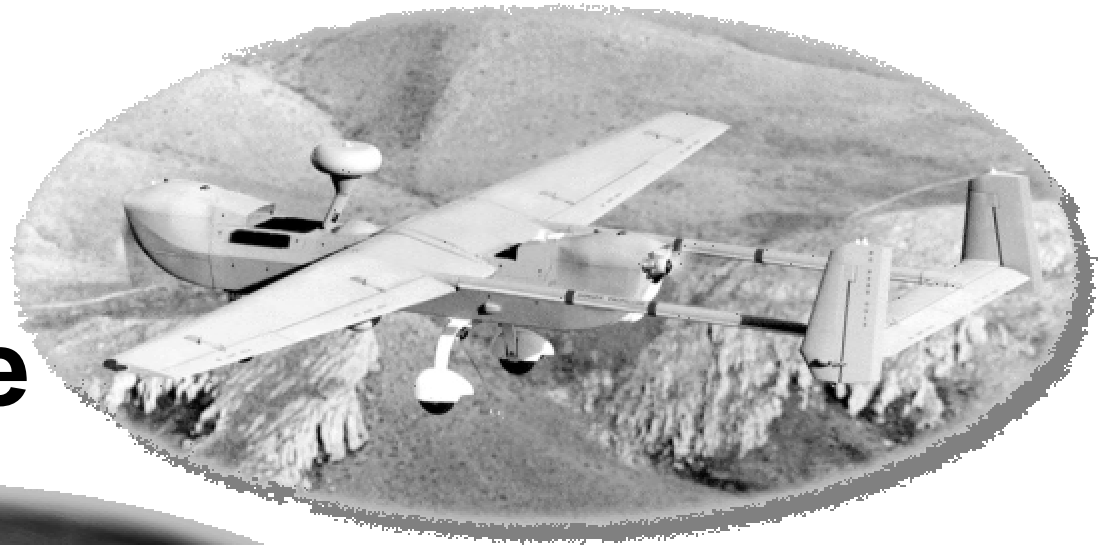


Tactical Unmanned Aerial Vehicle



Update



Agenda



—“TUAV-Protecting the Point”

- ✓ **Army Vision**
- ✓ **Shadow 200**
- ✓ **Hunter**
- ✓ **Payload Development**
- ✓ **IBCT**
- ✓ **Summary**



TUAV Supports the Army's Vision



—“TUAV-Protecting the Point”

**“.... a strategically responsive force that is dominant
across the full spectrum of operations....”**

- **Deployability**

- Designed to minimize system transport requirements (2 C130s for BDE TUAV)
- Tailored to support early entry operations (1 C130 for a 72 hour capability)
 - Integral part of the initial Brigade RSTA capability

- **Lethality**

- Provides timely critical combat information to commanders - increases effectiveness/lethality of the Combined Arms Force
- Provides critical information of potential targets - allows Commanders to prioritize smart and dumb munitions

- **Full Spectrum Dominance**

- *As proven with Hunter in Kosovo*, provides flexible, responsive RSTA, Battle Damage Assessment, and Battle management support *in combat and peacekeeping operations*

- **Survivability –**

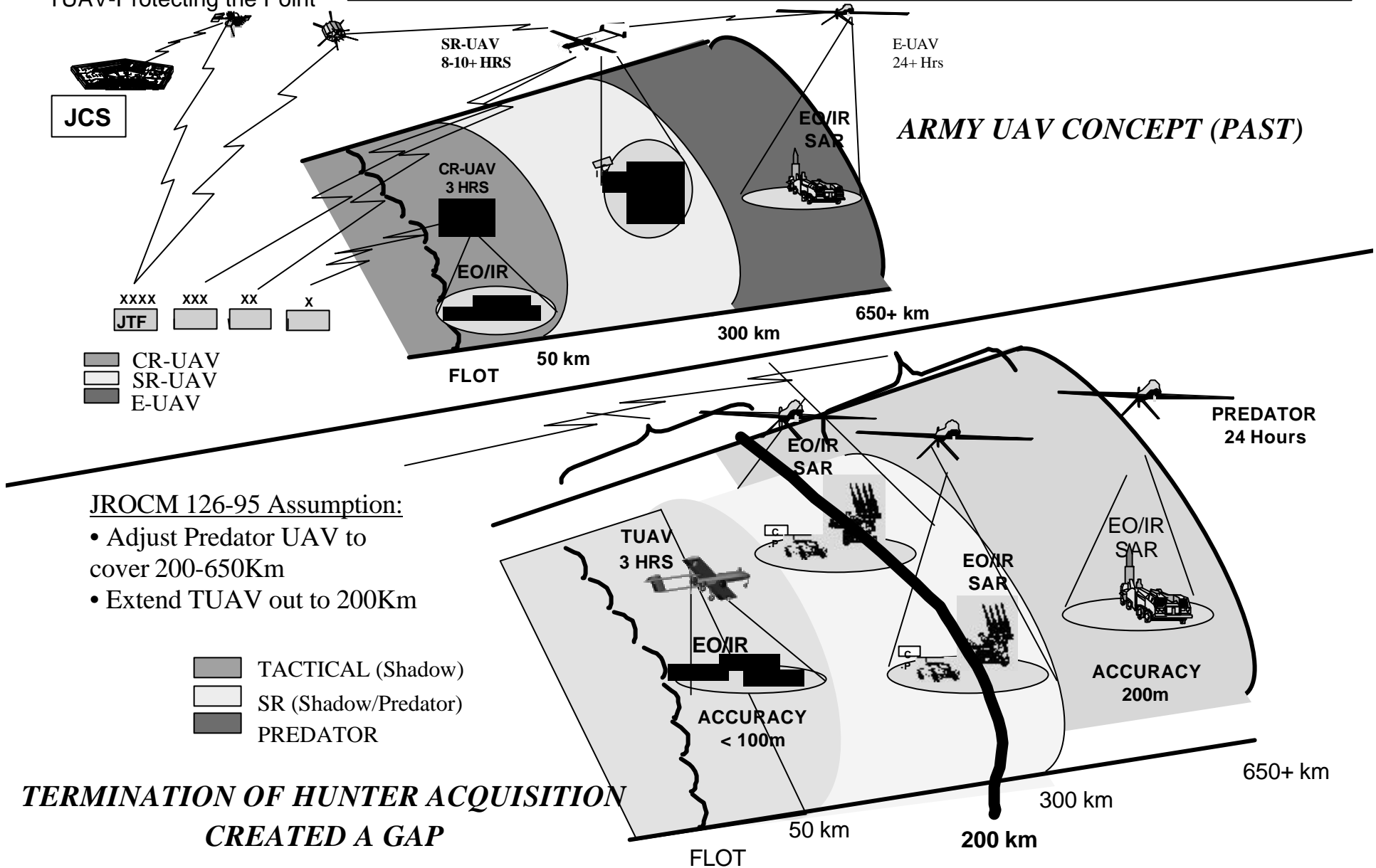
- In battle: Commander knows where the enemy is and is not – better understands where he can / cannot take risks
- In peacekeeping operations: Commander has better situational understanding - can avoid confrontations and high risk situations



Background - Joint Perspective



—“TUAV-Protecting the Point”





Tactical UAV



—“TUAV-Protecting the Point”

Objective

IAW JROCM 030-99 encourages the Defense Acquisition Executive to pursue a path that obtains the 200 kilometer range objective and permits a single UAV system to meet Army requirements

The Army's First Priority

Field a capable UAV system to the ground maneuver Brigade Commanders as quickly as possible.

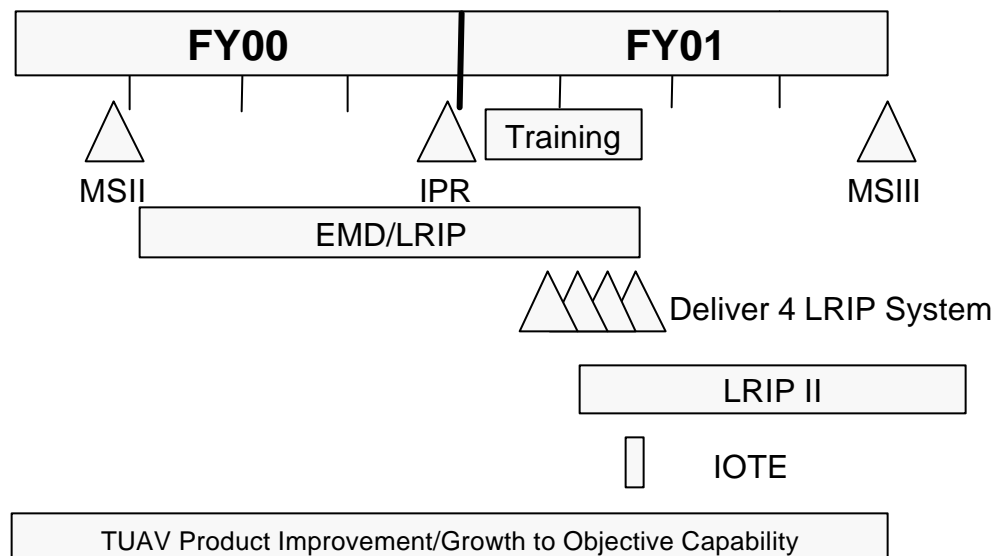


Activity Overview

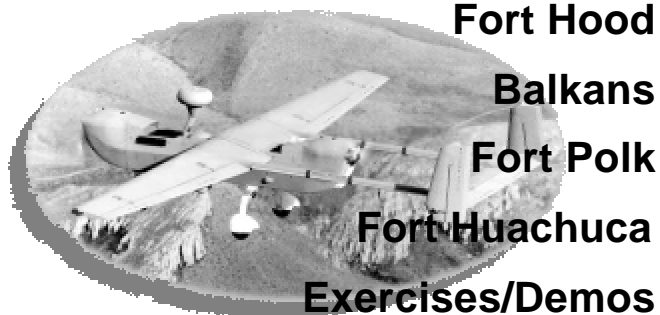


—“TUAV-Protecting the Point”

Shadow - Brigade TUAV



Hunter Operations



Mission Payload, Tactics, Techniques, and Procedures Development





Brigade TUAV Acquisition Strategy



—“TUAV-Protecting the Point”

Army Goal: A Single UAV System

Step 1: Field a capable Maneuver Brigade Commander's UAV as quickly as possible

- Simple, Basic EO/IR (no bells or whistles)
- Operating in an Army 2010 environment
- Meets situational awareness needs
- Part of the triad (Scouts, ACT, UAV) -- allowed us to reduce combat power in the heavy division

**Best Value
System Meeting
KPPs**

**Off-the-
Shelf**

**Later Growth
to Objective
Capability**



Brigade TUAV Requirements



—“TUAV-Protecting the Point”

- ***Fuel** -- (T) MOGAS, (O) heavy fuel
- ***C4I Interoperability** -- (T) GCS compatibility with JTA-A, ABCS, CGS, (O)FBCB2
- ***Payload** -- day/night passive imagery at operational altitude (T)Recognition; (O)Identification
- **Range/Endurance (on station time)** -- (T) 4 hours @ 50 Kms / (O) 4 Hrs @ 200 Kms
- **Target Location Error** -- (T) 80m (O) 20m
- **OPTEMPO** -- 12 hours in 24 hours, surge to 18 hours in 24 hours for a 72 hour period
- **Transportability** -- Entire system transported in 2 HMMWV w/shelters, 2 HMMWV troop transports and 2 trailers
- **Deployability** -- 2 C-130 and slingable
- **Launch and Recovery** -- Unprepared surface/soccer field sized area. Auto-launch/recovery is objective.
- **TCS & TCDL** - Threshold

* = KPP

T = Threshold Requirements

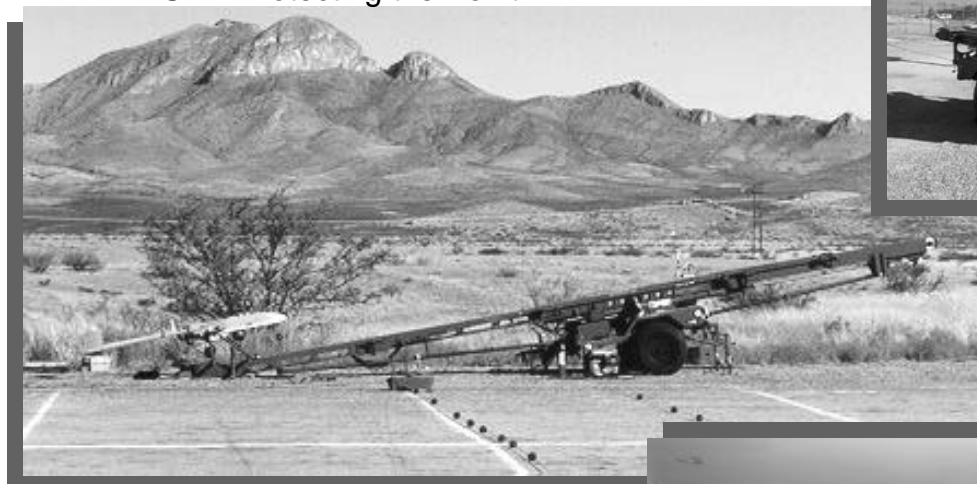
O = Objective Requirements



Shadow 200 System Elements



—“TUAV-Protecting the Point”





Shadow 200



—“TUAV-Protecting the Point”

Mission: Army Brigade Level reconnaissance, surveillance, target acquisition, and battle damage assessment



Characteristics/Description:

Wing Span	13 feet
Weight (Gross)	350 lbs
Range	125 km (200 km obj)
Airspeed	(70 kt loiter, 105 kt dash)
Altitude	15,000 Ft
Endurance	4 Hours @ 50 km
Payload (s)	EO/IR (up to 60 lb)
Launch/Recovery	100m x 50m Area

Capability

- Automatic Landing and Takeoff
- System transportable on 2 C-130s
- Early entry capability with 1 C-130
- Compatible with ABCS

Contractors:

- AAI Corporation (Prime) / Raytheon (Sub)

Program Milestones:

• Milestone II ASARC	Dec 99
• LRIP I System Delivery Begins	1Q01
• Initial Training	1Q01
• IOTE	3Q01
• FUE	3Q01
• LRIP II Begins	4Q01
• Milestone III	4Q01
• IOC	2Q02

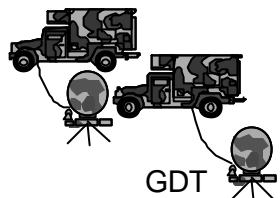
System Description



—“TUAV-Protecting the Point”



Ground Control Stations



GDT

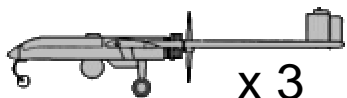
Personnel/Equipment
Transport & Trailer



Air Vehicle Transport
& Launch
Trailer



Air Vehicles w/Payloads



x 3

Portable Ground
Control Station &
Data Terminal



x 1

Basic Brigade TUAV System



x 4

Remote Video Terminal
and Antenna



Personnel

- 1 x 35D (Platoon Leader)
- 1 x 350U (UAV Warrant Officer)
- 1 x 96U (Platoon Sergeant)
- 12 x 96U (Air Vehicle Operators)
- 2 x 33W (EW System Repairer)
- 1 x 52D (Engine Mechanics)

Brigade Maintenance Contact Team



- 2 x 33W (EW System Repairer)
- 2 x 52D (Engine Mechanic)



x 1



x 1

Personnel/Equipment Transport



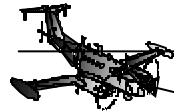


Brigade Commander's TUAV

—“TUAV-Protecting the Point”

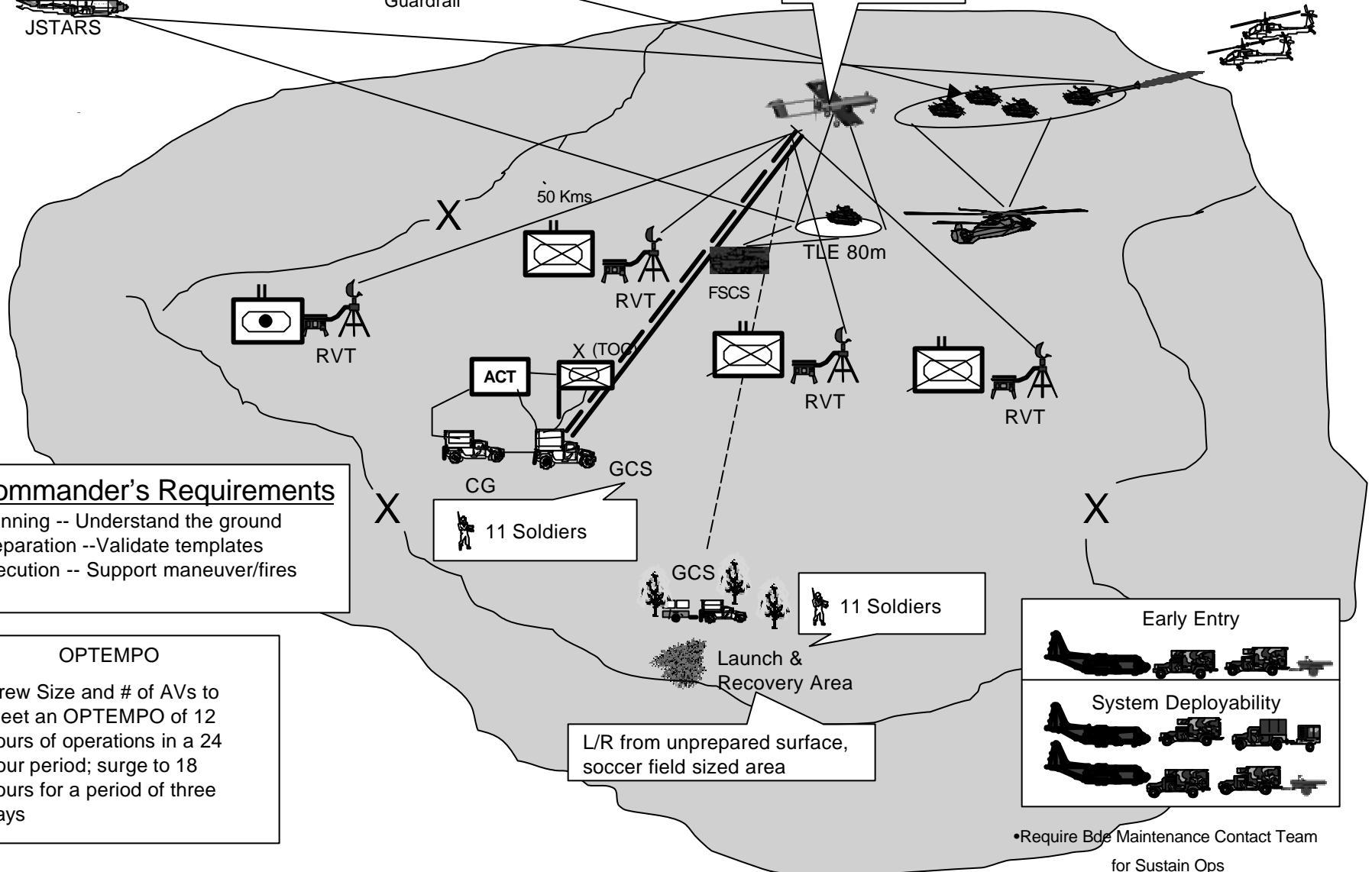


JSTARS



Guardrail

4hrs @ 50 Kms





Schedule Overview



—“TUAV-Protecting the Point”

EMD/LRIP

Deliver 4 LRIP Systems

Training

DT User Test (OPTEMPO)

IOTE

FY01 Long Lead Decision

IOC

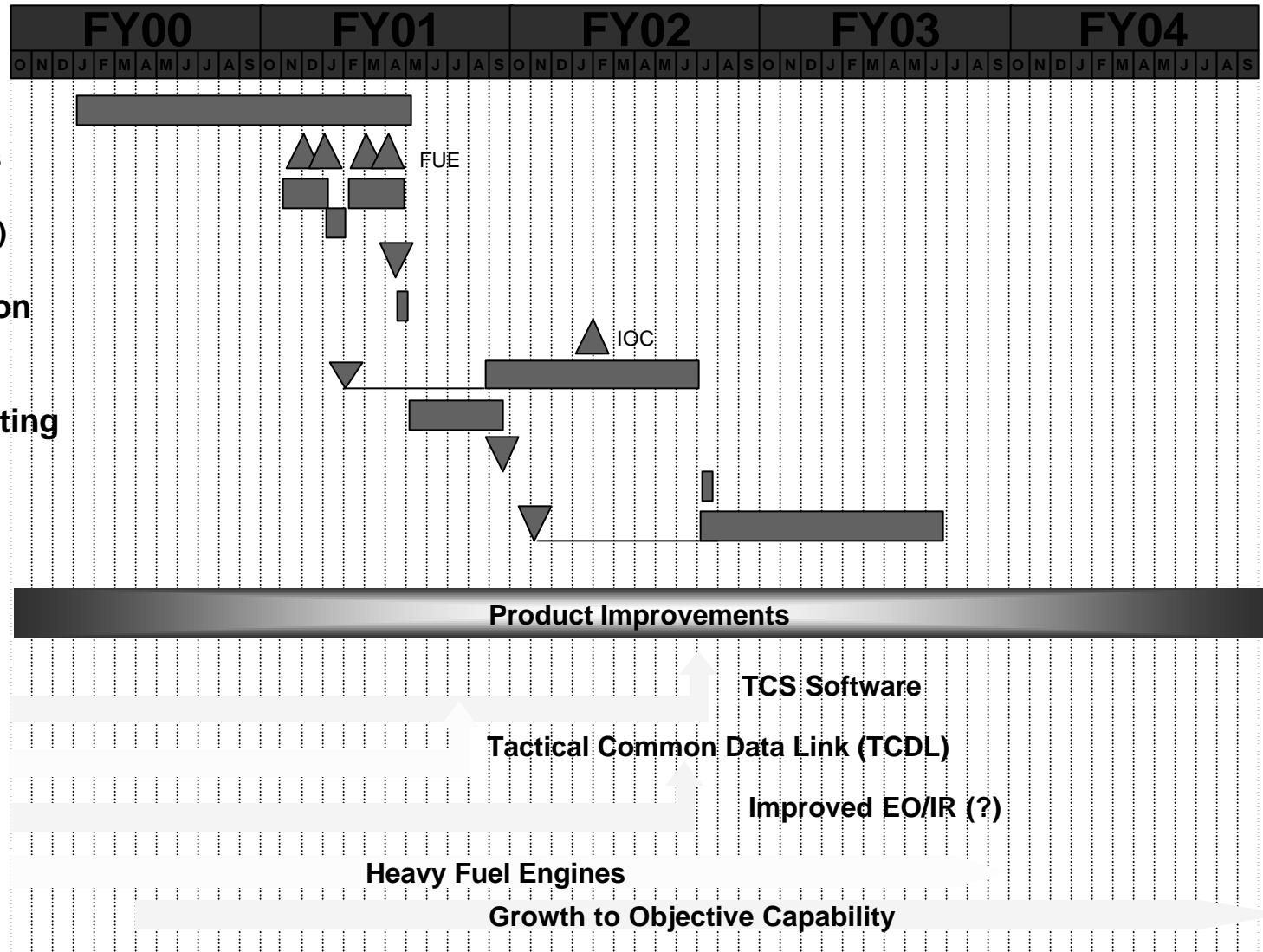
LRIP II (FY01)

ATEC/DOE Report Writing

Milestone III

Limited User Test

Production FY02



Hunter System Elements



—“TUAV-Protecting the Point”



Hunter UAV



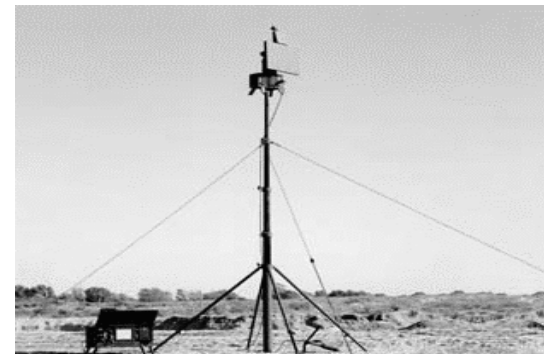
Ground Control Station (with mobile power unit)



Ground Data Terminal



Launch and Recovery Terminal



Remote Video Terminal



TUAV

Hunter Short Range UAV



—“TUAV-Protecting the Point”

Mission: Division and Corps Level reconnaissance, surveillance, target acquisition, and battle damage assessment



Characteristics/Description:

Wing Span	29 Feet
Weight	1600 Lbs
Range	>200KM
Airspeed	90 Kts cruise (106 Kts Dash)
Altitude	15,000 Ft
Endurance	8-12 Hours
Payload (s)	EO/IR and other
Launch/Recovery	200M x 75M (Unimproved)

Capability

- Fully Qualified System
- Versatile Payload Platform
- Multiple Mission Configurations
- CLS Depot Maintenance & Supply in Place
- Stellar NTC/JRTC Performance
- Low mishap rate

Contractors:

- TRW (Prime) / IAI

Status:

- Acquisition terminated by DAE on 31 Jan 96
 - 7 LRIP Systems produced
- One System Fielded to III Corps, Fort Hood
- One System in Training Base, Fort Huachuca
- One System to JRTC Jun 99



Hunter Deployment 1999

15th Military Intelligence Bn (AE)



—“TUAV-Protecting the Point”



3864 Flight Hours
In 675 flights
4 Apr – 31 Oct 99



- Wheels up on 29 Mar 99 from Ft. Hood
- First Hunter Flight on 4 Apr 99
- System supported from depot in Arizona



- Extensive use of relay mode
- Launch & Recovery integrated at an international airport



REAL WORLD SUCCESS!

14012-1445-29DEC99



Hunter Deployment 2000

15th Military Intelligence Bn (AE)



—“TUAV-Protecting the Point”



187.7 Flight Hours
through
16 May 00



- Arrived in Macedonia 1 Apr 00
- First Hunter Flight on 14 Apr 99
- System supported from depot in Arizona

- Launch & Recovery integrated at an international airport

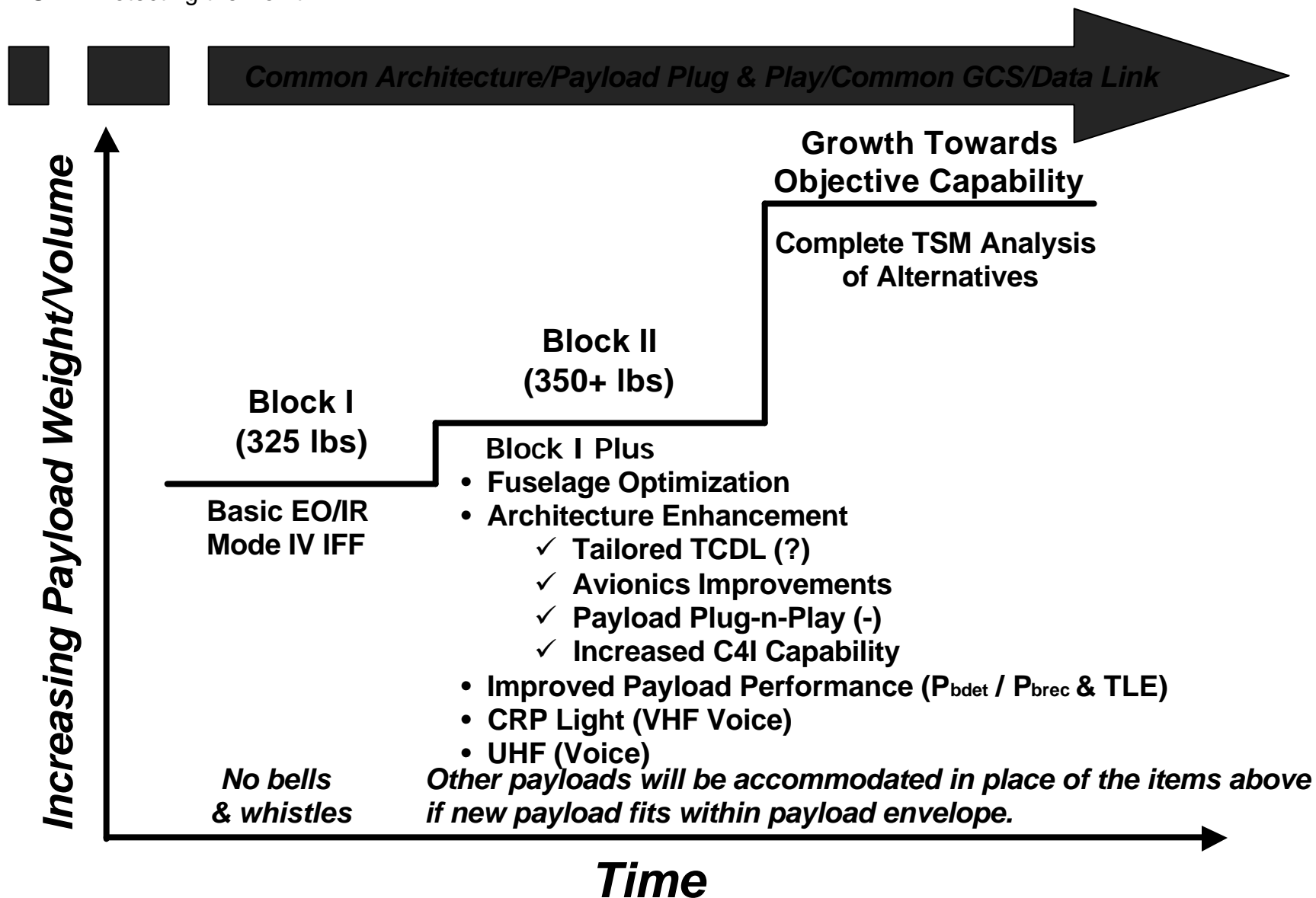




Air Vehicle / Payload Integration Path



—“TUAV-Protecting the Point”



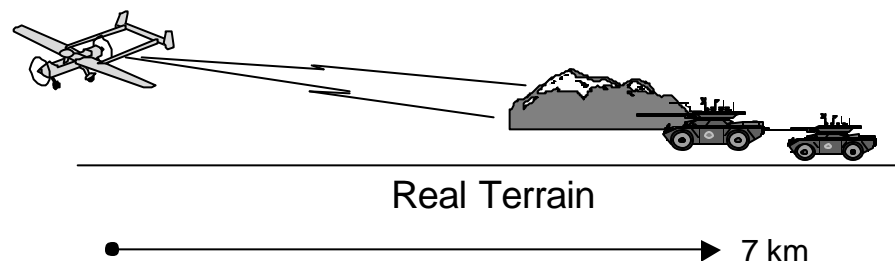
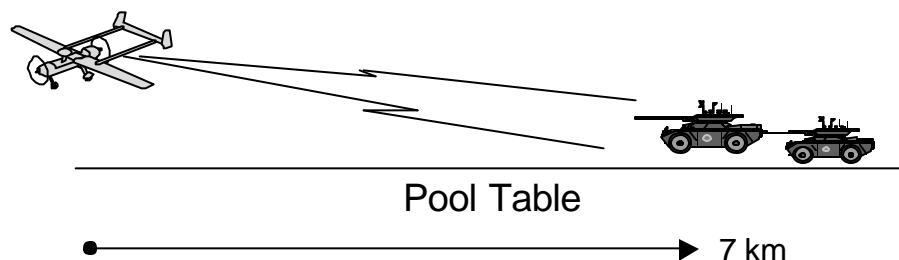


New Payloads Benefits and Cost



—“TUAV-Protecting the Point”

- Better payloads don't necessarily equate to a battlefield benefit



- To show a benefit, a valid high resolution scenario must be used/analyzed
- Multiple terrains should be examined: SWA, Europe, Korea
- Then, if a benefit is shown, we must analyze “is it worth the cost?”

**10% increase in performance vs. 50% increase in cost -
may be a “NO GO”**



Army UAV Payload Prioritization



—“TUAV-Protecting the Point”

Top Five

(Staffed with Core TRADOC ICT Members)

TUAV (BDE)	TUAV (Div/Corps)	MAE	HAE
1. EO / IR	EO / IR	EO/IR	SAR/MTI
2. SAR/MTI	SAR/MTI	SAR/MTI	EO/IR
3. CRP	CRP	CRP	SIGINT
4. HSI/USI	LRF/LD	HSI/USI	ACN
5. LRF/LD	HSI/USI	SIGINT	HSI/USI

Acronym Box

EO/IR	- Electro Optical / Infrared
SAR/MTI	- Synthetic Aperture Radar / Moving Target Indicator
CRP	- Communication Relay Package
HSI/USI	- Hyperspectral / Ultraspectral Imaging
LRF/LD	- Laser Range Finder / Laser Designation
MAE	- Medium Altitude Endurance
HAE	- High Altitude Endurance
ACN	- Airborne Communications Node



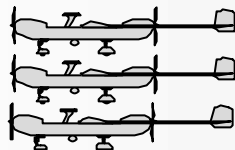
Brigade TUAV Surrogate vs. Brigade TUAV Baseline



—“TUAV-Protecting the Point”

Proposed Bde TUAV Surrogate Baseline

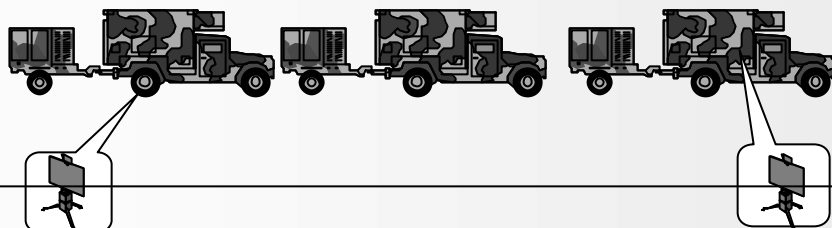
Bde TUAV Baseline



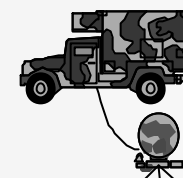
Air
Vehicles



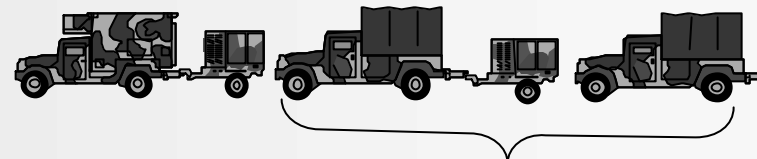
Air Vehicle
Transport



Control
Stations



Antennas
& Cargo



Fuel

Contact Team

Fuel Bladder may replace this truck

Army TUAV System



The system is much more than an airframe "Point"



Portable Ground Control Station & Data Terminal



Launcher



Air Vehicles

Payloads



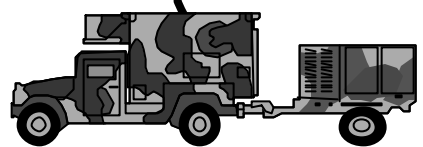
Ground Data Terminals



Ground Control Station and C4I

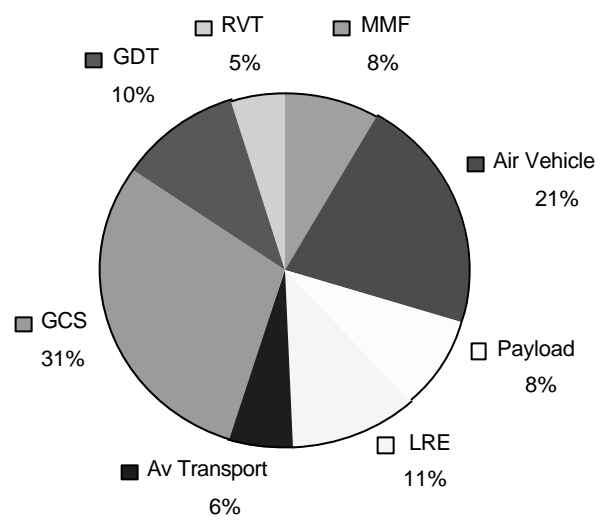


Personnel



Contact Teams

TUAV Hardware Cost (to Include GFE)





Summary



—“TUAV-Protecting the Point”

- Now....providing a UAV capability with existing Hunter resources
- For the futureusing legacy systems to define/develop
 - Initial Brigade Combat Team capabilities
 - Supporting Combat Training Center Rotations
 - Product Improvements
- For the future.....satisfy the Maneuver Brigade Commander's UAV needs – Brigade TUAV in development

